

# DR. EVA C. HERBST

## PERSONAL INFORMATION

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ADDRESS: Palaeontological Institute and Museum  
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[GoogleScholar](#) - [Github](#) - [Figshare](#) - [Morphosource](#) - [Publons](#)

## EDUCATION

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2016 - 2020 PhD in Biomechanics and Palaeontology  
*Structure and Motion Lab, Royal Veterinary College, London*  
Supervisors: Prof. John R. Hutchinson and Dr. Chris Richards

2012 - 2016 B.A. in Integrative Biology  
*U.C. Berkeley*

2013 - 2014 Degree of Higher Education in Biomedical Sciences  
*Durham University*  
Year of Study Abroad, Certificate of Higher Education

## EMPLOYMENT AND RESEARCH EXPERIENCE

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2019 - PRESENT Postdoc Palaeontological Institute and Museum, University of Zurich  
*investigating form and function of Triassic reptile skulls*

2019 - PRESENT Lead Researcher OATech+ Network Pump Priming Project  
*analysing bony architecture to monitor osteoarthritis of the knee*

2019 OATech+ Network Early Career Researcher Placement  
*osteoarthritis project, Prof. Andrew Pitsillides, Royal Veterinary College, London*

2016 - 2020 PhD in Palaeontology and Biomechanics  
*Structure and Motion Lab, Royal Veterinary College, London*

2016 National Science Foundation Research Experience for Undergraduates Project  
*Comparative Biomechanics, Palaeontology, and Evolution, University of Missouri*

2015 - 2016 Undergraduate Research Apprenticeship Program  
*Hummingbird Flight Analysis, U.C. Berkeley*

2014 - 2016 Research Assistant and Archivist  
*Human Evolution Research Center, U.C. Berkeley*

2013 - 2016 Research Intern and Staff  
*Safari West Osteology, Santa Rosa, California*

2014 - 2015 Undergraduate Research Apprenticeship Program  
*Rodent Mandible Morphology Project, U.C. Berkeley*

## HONORS AND AWARDS

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- 2021 **D. Dwight Davis Award, Society of Integrative and Comparative Morphology**  
Best student oral presentation in the Division of Vertebrate Morphology
- 2020 **Swiss Commission of Palaeontology Prize**  
Best presentation in palaeontology given at the Swiss Geoscience Meeting
- 2016 **Franklin M. Henry Award, Integrative Biology, UC Berkeley**  
Outstanding achievement in human performance and health research
- 2016 **Distinction in General Scholarship, UC Berkeley**  
Awarded to graduates achieving high grade point average
- 2013, 2015 **Dean's Honors, UC Berkeley**  
Awarded to graduates achieving high grade point average

## PEER-REVIEWED PUBLICATIONS

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- 2021 **Herbst, E. C., Felder, A. A., Evans, L. A. E., Ajami, S., Javaheri, B., Pitsillides, A. A.** A new straightforward method for semi-automated segmentation of trabecular bone from cortical bone in diverse and challenging morphologies. [Royal Society Open Science 8\(8\)](#)
- 2020 Ortega-Jimenez, V. M., **Herbst, E. C.**, Leung, M. S., and Dudley, R. Natural barriers: waterfall transit by small flying animals. [Royal Society Open Science: 7201185](#)
- 2019 **Herbst, E. C.**, Doube, M., Smithson, T. R., Clack, J., and Hutchinson, J. R. Bony lesions in early tetrapods and the evolution of mineralized tissue repair. [Paleobiology 45\(4\)](#)
- 2010 **Herbst, E. C.** and Hutchinson, J. R. New insights into the morphology of the Carboniferous tetrapod *Crassigyrinus scoticus* from computed tomography. [Earth and Environmental Science Transactions of The Royal Society of Edinburgh 109\(1-2\)](#)

## GRANTS AND FUNDING

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- 2020 **University of Zurich GRC Grant**  
Project: organized and hosted finite element analysis [seminar series and workshop](#) with over 200 participants and developed a [website](#) and [Github organisation](#) for sharing finite element modeling methods  
Funds: 10,000 CHF
- 2019 **OATech+ Biomechanics and Mechanobiology Pump Priming Fund**  
Project: Using 3D trabecular architecture as a biomarker to identify and monitor osteoarthritis of the knee  
Funds: 10,000 GBP
- 2019 **OATech+ Next Generation of OATech Leaders Fund**  
Placement with Prof Andrew Pitsillides at RVC to work on osteoarthritis project (see above)  
Funds: 3,000 GBP

## GRANTS AND FUNDING CONT.

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- 2019 **Royal Veterinary College Foreign Travel Fund**  
To present research at ICVM conference  
Funds: 300 GBP
- 2018 **Royal Veterinary College Foreign Travel Fund**  
To present research at SICB conference  
Funds: 300 GBP
- 2016 **Research Experience for Undergraduates, National Science Foundation**  
Biomechanics research internship with Prof. Casey Holliday and Prof. Kevin Middleton, University of Missouri  
Funds: 3,500 USD

## INVITED TALKS AND WORKSHOP

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- 2021 *Motion capture and computational approaches to investigate joint range of motion*  
Palaeontology Discussion Group, University of Birmingham, UK.
- 2021 *Workshop: [how to clean 3D meshes in Blender](#)*  
[FunkyMUG](#) (Functional Morphology Users Group). Online. [Recording available on Youtube](#)
- 2021 *New methods support the possibility of a salamander-like walk in the Permian tetrapod Eryops.* Comparative Zoology Lab, Humboldt University Berlin, and Natural History Museum Berlin, Germany.
- 2020 *Investigating joint range of motion in salamanders and early tetrapods.*  
Evolutionary Morphology and Biomechanics Group, University of Liverpool, UK.
- 2019 *Computational analysis of the evolution of amphibian locomotor modes.*  
Postgraduate Research Day, Final Year PhD Session, Royal Veterinary College, London.
- 2017 *Functional morphology of Crassigyrinus scoticus: gaining insight into locomotor evolution in early tetrapods.*  
Postgraduate Research Day, Royal Veterinary College, London. (Poster)
- 2017 *Computational analysis of the evolution of amphibian locomotor modes.*  
Postgraduate Seminar Series, Royal Veterinary College, London.

## CONFERENCE PRESENTATIONS

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\* denotes co first author; first author listed = presenting author

- 2021 **Herbst, E. C.**, Lautenschlager, S., Fioritti, N., Meade, L., Scheyer, T.M. 2021. *Modelling muscle volumes for finite element analysis and multibody dynamics* XVIII International Symposium on Computer Simulation in Biomechanics. Online. (Talk)
- 2021 Evans, L. A. E.\*, **Herbst, E. C.\***, Felder, A. A., Ajami, S., Jahaveri, B., Pitsillides, A. A. *Do 3D epiphyseal bone architectural changes in ageing STR/Ort and healthy mice reveal early imaging biomarkers of osteoarthritis?* Society Annual Meeting. Online. (Talk, winner of New Investigator Award)
- 2021 **Herbst, E. C.**, Eberhard, E., Manafzadeh, A. R., Richards, C., Hutchinson, J. R. *New methods support the possibility of a salamander-like walk in the Permian tetrapod Eryops*. Society for Integrative and Comparative Biology Annual Meeting, Online. (Talk, winner of D. Dwight Davis Award Session)
- 2021 **Herbst, E. C.**, Bastiaans, D., Miedema, F., Scheyer, T.M., Lautenschlager, S. 2021. *How important is modeling tooth enamel in FEA comparisons of whole skulls? Comparing common simplifications with biologically realistic models*. Society for Integrative and Comparative Biology Annual Meeting, Online. (Poster)
- 2021 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Bringing fossils back to life: 3D cranial reconstructions of the highly flattened remains of thalattosauriformes. Society for Integrative and Comparative Biology Annual Meeting, Online. (Talk)
- 2020 **Herbst, E. C.**, Eberhard E., Manafzadeh A. R., Richards C., Hutchinson J. R. 2020. Was the early tetrapod *Eryops* capable of a salamander-like walk? Developing new methods to test paleontological hypotheses about posture and gait. Swiss Geosciences Meeting, Online. (Talk, winner of Swiss Commission of Palaeontology Prize)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Re-fleshing fossils: cranial reconstructions of thalattosauriformes. Swiss Geosciences Meeting, Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Webb, N. M., Haeusler, M. Scheyer, T. M. 3D Data, a gateway to open science: the FEZ initiative. OILS (Open Innovation in Life Sciences), Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Virtual paleontology: a modern look at ancient material OILS (Open Innovation in Life Sciences), Online. (Talk)
- 2020 Bastiaans, D., **Herbst, E. C.**, Scheyer, T. M. Thalattosauriformes: schedelreconstructies van Triassische weirdos. NKVP (Nederlandse Kring van Vertebraten Paleontologen), Online (Talk).
- 2020 **Herbst, E. C.**, Felder, A. A., Evans, L. A. E. , Jahaveri, B., Ajami, S., Pitsillides, A. A. A new automated method of segmenting trabecular bone: investigating subchondral trabecular changes as a predictor of osteoarthritis at the joint surface. Bone Research Society Annual Meeting, Online. (Poster)
- 2020 **Herbst, E. C.**, Eberhard, E., Richards, C., Hutchinson, J. R. Comparing in vivo and ex vivo knee range of motion in salamanders: a new method for investigating joint mobility. CAMS-Knee OpenSim Workshop, ETH, Zürich. (Poster)
- 2019 **Herbst, E. C.**, Eberhard, E. A., Richards, C. T., Hutchinson, J. R. 2019. A new method for investigating joint mobility and its relevance for inferring locomotor evolution in early tetrapods. 12th International Congress of Vertebrate Morphology, Prague, Czech Republic, abstract doi:10.1002/jmor.21003 (Talk)

## CONFERENCE PRESENTATIONS CONT.

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- 2018 **Herbst, E. C.**, Doube, M., Smithson, T. R., Clack, J., Hutchinson. J. R. Paleopathologies in Carboniferous tetrapods and the evolution of bone healing. Society of Vertebrate Paleontology, 78th Annual Meeting, Albuquerque, New Mexico. (Poster)
- 2018 C. M. Holliday, **Herbst, E. C.**, M. Jacoby, A. Smolinsky, K. Sellers. Morphometric and modeling approaches to understanding the evolution of pseudosuchian mandibular symphyses. Society of Vertebrate Paleontology, 78th Annual Meeting, Albuquerque, New Mexico. (Talk)
- 2018 **Herbst, E. C.** 2018. New elements discovered in the early tetrapod *Crassigyrinus scoticus*. DVM SICB Regional Meeting, Natural History Museum, London. (Talk)
- 2018 **Herbst, E. C.**, Smithson, T. R., Clack, J., Doube, M., Hutchinson. J.R. Bony lesions in early tetrapods and the evolution of bone healing. Society of Integrative and Comparative Biology Annual Meeting, San Francisco. (Talk)
- 2018 **Herbst, E. C.**, Smithson, T. R., Clack, J., Doube, M., Hutchinson. J.R. Bony lesions in early tetrapods and the evolution of bone healing. Society of Integrative and Comparative Biology Annual Meeting, San Francisco. (Talk)
- 2017 **Herbst, E. C.** and Hutchinson, J. R. New insights into the morphology of the Carboniferous tetrapod *Crassigyrinus scoticus* gleaned from computer tomography. The Early Tetrapod World: a one-day conference celebrating the career of Prof Jenny Clack FRS. University of Cambridge. (Invited Conference Talk)
- 2017 **Herbst, E. C.**, Smithson, T. R., Clack, J., Hutchinson. J. R 2017. Pathology in the early tetrapod *Crassigyrinus scoticus*. Progressive Palaeontology Annual Meeting, University of Leicester. (Talk)

## TEACHING

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### Teaching Positions

- 2021 Bio 262 Evolutionary Morphology of Vertebrates - Issues and Methods  
University of Zurich
- 2020 Bio 267, Paleobiology and Evolution of Vertebrates, University of Zurich
- 2016-2019 Research Skills Facilitator, Royal Veterinary College, London
- 2017-2018 Comparative Animal Locomotion Module, Royal Veterinary College, London

### Lectures

- 2021 *Using Computer Tools to Investigate Biomechanics of Animals.*  
Bio 262, University of Zurich
- 2020 *Using Computer Modeling to Investigate Biomechanics of Extinct Animals.*  
Bio267, University of Zurich

### Tutoring

- 2017 - 2019 Postgraduate Writing Tutor, Royal Veterinary College, London
- 2011 - 2012 Private Tutor (Writing, Math)

## TECHNICAL SKILLS AND PROGRAMS

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CT SEGMENTATION AND 3D MODELING	Mimics, Avizo, Blender, Rhino
ANALYSIS AND SCRIPTING	Matlab, Python, Java
FINITE ELEMENT ANALYSIS & MULTIBODY DYNAMICS	Hypermesh, Abaqus, Artisanth
SCIENTIFIC ROTOSCOPING AND ANIMATION	Maya

## OPEN ACCESS WORK

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- SHARED WORKFLOWS    • method for [automatic segmentation of trabecular bone](#)  
                                  • [Blender remeshing guide](#) for FEA
- FEZ INITIATIVE        Founder of [Finite Element Zurich](#)
- CT DATA            CT stacks used in my papers are open access on [Figshare](#)
- 3D MODELS          3D Models I created are available on [Morphosource](#)
- OPEN ACCESS COURSE    Completed [Open Life Science Program](#) fall 2020

## OUTREACH

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- 2020    [Interview](#) with Real Scientists DE (in German)
- 2019    Outreach display, Early Tetrapod Evolution  
          Night at the Vet College, Royal Veterinary College, London
- 2017    Outreach display, Early Tetrapod Evolution  
          Annual Open Day, Royal Veterinary College, London
- 2017    Guest [blog post](#) about *Crassigyrinus* on Anatomy to You blog
- 2013-2016    Comparative anatomy outreach events at Safari West Wildlife Park

## PROFESSIONAL DEVELOPMENT AND CERTIFICATES

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- 2021    [Scientific Programming with Python](#), Physics Department, UZH
- 2020    [Open Life Science Course](#)
- 2020    [SlicerMorph 3D Morphometrics Course](#)
- 2019    Avizo Course 3DMAGINATION Ltd.
- 2018    MatLab Fundamentals Course
- 2017    Teaching and Learning in Higher Education Certificate Royal Veterinary College, London

## LANGUAGES

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ENGLISH:    fluent  
GERMAN:    fluent